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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,390	03/12/2004	Paul D. Brabant	ASMEX.448A	7151
20995	7590	07/24/2006	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			VU, DAVID	
2040 MAIN STREET			ART UNIT	
FOURTEENTH FLOOR			PAPER NUMBER	
IRVINE, CA 92614			2818	

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/800,390

Applicant(s)

BRABANT ET AL.

Examiner

DAVID VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 64-77 is/are pending in the application.
- 4a) Of the above claim(s) 31-36 and 64-77 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27, 29 and 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-36 and 64-77 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date: _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>04/19/06</u>  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### **Continued Examination Under 37 CFR 1.914**

1. A request for continued examination under 37 CFR 1.114, including the, fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/19/06 has been entered.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 9-13, 15-20, 25-27 and 29 are rejected under 35 U. S. C. 102(b) as being anticipated by Tohru (EP 0 858 101 A2).

Tohru discloses a method for depositing an epitaxial Ge-containing layer {See [Second Embodiment] (col. 7, lines 10-48)}, comprising heating a single crystal Si structure 1 to a first

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temperature (600-650°C) (col. 7, lines 15-18); cooling the single crystal Si structure 1 to a second temperature (550°C) (col. 7, lines 23-25); depositing an epitaxial layer 4 over the single crystal Si structure 1 at the second temperature {figs. 3(a)-3(f)} by exposing the first epitaxial silicon layer 1 to a deposition gas comprising silane/disilane or german/digermane and silicon (col. 7, lines 26-33 and col. 1, lines 13-19).

3. Claims 1-6, 9-13, 15-20, 25-27 and 29 are rejected under 35 U. S. C. 102(e) as being anticipated by Chu et al. (US Pat. 6,875,279, hereinafter Chu).

Chu discloses a method for depositing an epitaxial Ge-containing layer {See EXAMPLE 1 (col. 7, line 45 through col. 8, line 11)}, comprising heating a single crystal Si structure 85 to a first temperature (700-950°C) (col. 7, lines 55-58); cooling the single crystal Si structure 85 to a second temperature (col. 7, lines 66-67); depositing an epitaxial layer 86 over the single crystal Si structure 85 at the second temperature {figs. 3(a)-3(f)} by exposing the first epitaxial silicon layer 85 to a deposition gas comprising silane, german and silicon (col. 8, lines 1-5; col. 3, lines 59-63 & col. 6, line 63 through col. 7, line 1).

4. Claims 1-6, 9-13, 15-20, 25-27 and 29 are rejected under 35 U. S. C. 102(e) as being anticipated by Kanzawa et al. (US Pat. 6,645,836, hereinafter Kanzawa).

Kanzawa discloses a method for depositing an epitaxial Si/SiGeC heterostructure by heating a single crystal Si structure 1 to a first temperature (800°C) in hydrogen gas (col. 5, lines 37-39); cooling the single crystal Si structure 1 to a second temperature (490°C); depositing an epitaxial SiGeC layer 8 over the single crystal Si structure 1 at the second temperature (490°C)

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by exposing the first epitaxial silicon layer 1 to a deposition gas comprising  $\text{Si}_2\text{H}_6$ ,  $\text{GeH}_4$  and  $\text{SiH}_2\text{Cl}_2$  as source gases (col. 5, lines 40-51).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 7, 8, 14, 21-24 and 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tohru (EP 0 858 101 A2).

Tohru fails to disclose the composition of Ge in the SiGe layer, the second temperature, cooling pressure, flow rate and thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Tohru by selecting a suitable

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process parameter for forming an epitaxial Ge-containing layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

6. Claims 7, 8, 14, 21-24 and 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Chu (US Pat. 6,875,279).

Chu fails to disclose the composition of Ge in the SiGe layer, the second temperature, cooling pressure, flow rate and thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Chu by selecting a suitable process parameter for forming an epitaxial Ge-containing layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

7. Claims 7, 8, 14, 21-24 and 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kanzawa (US Pat. 6,645,836).

Kanzawa fails to disclose the composition of Ge in the SiGe layer, the second temperature, cooling pressure, flow rate and thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kanzawa by selecting a suitable process parameter for forming an epitaxial Ge-containing layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering

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the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

### **Response to Arguments**

8. Applicant's arguments with respect to claims 1-27, 29 and 30 have been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The art cited on the *Notice of References* is included as teaching the general state of the art relating to the instant invention.

US Pat. 6,633,066 (Bae et al.; Abstract) are cited as teaching a  $\text{Si}_{1-x}\text{Ge}_x$  layer is preferably epitaxially grown from the unstrained silicon active layer. This epitaxial growth step may include providing an unstrained silicon active layer (or initially epitaxially growing an unstrained silicon active layer on a substrate) and then continuing growth of a  $\text{Si}_{1-x}\text{Ge}_x$  layer on the active layer by increasing the concentration of Ge in a graded manner until a maximum desired Ge concentration is obtained. Further growth may then occur by reducing the concentration of Ge in a graded manner back to  $x=0$ . The grading of Ge in the  $\text{Si}_{1-x}\text{Ge}_x$  layer may constitute a linear grading.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The

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examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith S can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID VU  
PRIMARY EXAMINER